

What is claimed is:

1. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:
  - (a) providing a silicon wafer covered with an insulating film whose main surface is mainly silicon oxide; and
  - (b) cleaning the main surface of said silicon wafer with a processing solution which includes hydrogen peroxide, hydricid fluoride salt, and water.
2. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein the hydricid fluoride salt included in said processing solut4on is ammonium fluoride.
3. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein the hydricid fluoride salt included in said processing solution is tetraalkyl ammonium fluoride.
4. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said processing solution includes HF and  $\text{HF}_2^-$  as etching seeds of silicon oxide.
5. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein a temperature of said processing solution in said step (b)

is one of an ordinary temperature and a temperature nearly equal thereto.

6. A method of manufacturing a semiconductor integrated circuit device according to claim 1, wherein said processing solution further includes a surfactant.

7. A method of manufacturing a semiconductor integrated circuit device according to claim 1, further comprising a step of cleaning a surface of said silicon wafer during ultrasonic vibration of said processing solution.

8. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:

- (a) providing a silicon wafer, from a surface of which silicon oxide and silicon are exposed;
- (b) cleaning the surface of said silicon wafer with a processing solution which includes hydrogen peroxide, hydracid fluoride salt, and water.

9. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein the hydracid fluoride salt included in said processing solution is ammonium fluoride.

10. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein

the hydracid fluoride salt included in said processing solution is tetraalkyl ammonium fluoride.

11. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein said processing solution includes HF and  $\text{HF}_2^-$  as etching seeds of silicon oxide.

12. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein a temperature of said processing solution used in said step (b) is one of an ordinary temperature and a temperature nearly equal thereto.

13. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein the silicon exposed from the surface of said silicon wafer is a substrate.

14. A method of manufacturing a semiconductor integrated circuit device according to claim 8, wherein the silicon exposed from the surface of said silicon wafer is a silicon film constituting a gate electrode.

15. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:

cleaning a surface of a silicon wafer with a processing solution containing hydrogen peroxide, hydracid fluoride salt and water; and

exposing a silicon layer from the surface of said silicon wafer.

16. A method of manufacturing a semiconductor integrated circuit device according to claim 15, wherein the hydracid fluoride salt included in said processing solution is ammonium fluoride.

17. A method of manufacturing a semiconductor integrated circuit device according to claim 15, wherein the hydracid fluoride salt included in said processing solution is tetraalkyl ammonium fluoride.

18. A method of manufacturing a semiconductor integrated circuit device according to claim 15, wherein said silicon layer is a substrate.

19. A method of manufacturing a semiconductor integrated circuit device according to claim 15, wherein said silicon layer is a silicon film constituting a gate electrode.

add 027